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REPORT OF PINE BEETLE SURVEY

ON THE

WHITMAN NATIONAL FOREST

SEASON OF 1940

By

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Forest Insect Investigations

April 11, 1941

Forest Insect Laboratory,
445 U. S. Court House,
Portland, Oregon

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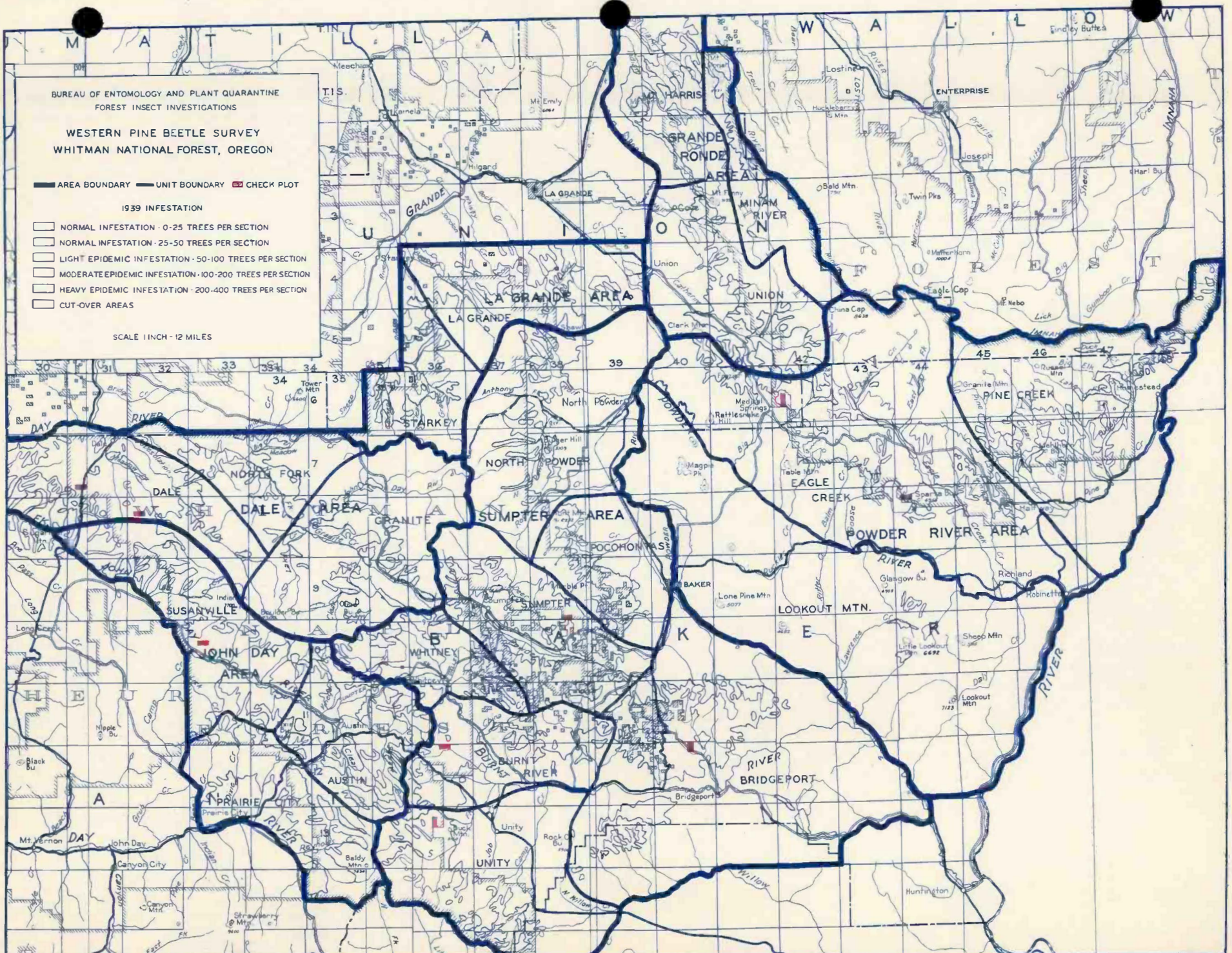
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT INVESTIGATIONS
WESTERN PINE BEETLE SURVEY
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Introduction

Surveys of the forest insect situation in ponderosa pine stands within and adjacent to the Whitman National Forest have been conducted annually since 1935. This season's survey was again carried on cooperatively by the Bureau of Entomology and Plant Quarantine and the Forest Service.

The purposes of these surveys are threefold: (1) To determine the yearly trend, intensity, and distribution of ponderosa pine losses caused by a certain group of tree-killing insects commonly called bark beetles, of which the western pine beetle (Dendroctonus brevicomis Lec.) is the most destructive; (2) to ascertain the need for artificial control work and to study the results of such work as was undertaken; (3) to determine what trees are most susceptible to bark beetle attacks and in what areas the stands are most subject to the ravages of the pine beetle and warrant first consideration in timber management plans.

The 1940 survey was conducted during the period August 15 to 26. It was both intensive and extensive in character. The Forest Service employed a crew of three field aides, H. J. Ostlind, G. R. Gregory, and R. F. Goodall (crew leader), to carry on the intensive phase of the survey. This consisted of making a 100% cruise of the current beetle losses on nine 320-acre check plots. A description of the check plots is given in Table No. 1. Their location on the forest is shown on Map No. 1.

The writer gave the crew technical supervision and carried on the extensive phase of the survey which consisted of making an observational reconnaissance of the pine type which covers some ~~213,000~~ 196,500 acres, having a stand of approximately ~~1,212,100,000~~ 4,971,500,000 board feet.

From the combined data of these two methods estimates were prepared of the total pine losses occurring on the forest, which amounted to some 15,913,000 board feet killed during 1939. These losses are presented by areas and units in Table No. 3. Their intensity and distribution on the forest are graphically shown on Map No. 2.

Past Losses

The present cycle of infestation first became noticeable about 1930, when epidemic conditions started to develop in many areas of the forest. This epidemic reached its greatest intensity during 1932, but the upward trend of infestation was abruptly halted in the winter of 1932-33 when extreme subzero temperatures caused widespread mortality to the overwintering broods of the western pine beetle. The infestation then declined, remaining at a low status until 1937 when an upward trend again commenced.

Recent Losses as Shown by the 1940 Survey

The 1940 Survey completed the 1939 loss data on the check plots and gave preliminary information on the 1940 loss trend. These data are given in Table No. 2. As less than 47 percent of the total 1940 loss had developed at the time of survey, the total loss for the season was estimated by employing an estimating factor developed from past surveys.

Infestation trends on check plots for the three-year period 1938-40 are presented in Table No. 3. These data show that the infestation fluctuated considerably during this period.

The upward trend of infestation which began during 1937 continued into 1938 killing 1.39 percent of the stand on the check plots. This aggressive upward trend was followed by a pronounced decline through 1939, the infestation declining beyond the 1936 low point of .54 to .43 percent of stand killed, the lowest point since the present epidemic cycle began.

The infestation again assumed an upward trend through 1940. Preliminary data indicate that losses probably amounted to approximately .97 percent of the green stand.

General Infestation Conditions 1939-1940

The pine beetle situation on the forest improved considerably during 1939. Light epidemics present during 1938 on the Powder River and Dale areas and lower portion of the John Day area declined to a normal infestation status. The moderate epidemic infestations in the Sumpter and Burnt River Valleys declined to light epidemics. However, during 1940 these infestations again assumed an upward trend and showed signs of becoming aggressive in the Unity and Burnt River units, where group killings were conspicuous.

A center of light epidemic infestation was discovered at the head of the John Day Valley in the Prairie City unit. This infestation undoubtedly was present during 1939 but not seen due to the pall of smoke that settled in the head of the valley from nearby fires.

Insects Affecting Other Tree Species

Little insect activity was noted affecting other tree species on the forest.

Recommendations

While not sufficiently aggressive to warrant control measures the infestation in the stands surrounding the head of the Burnt River Valley will bear careful watching, as aggressive tendencies were shown by this infestation during 1940 and could quickly precipitate a critical situation.

Summary

The 1940 survey was carried on during the period August 15 to 26, 1940.

The infestation, which had become aggressive during 1938, killing 1.39 percent of stand on check plots, declined through 1939 to .43 percent of stand killed, the lowest since the present epidemic cycle began. A moderate increase occurred during 1940.

The heaviest centers of infestation are again in the Sumpter and Burnt River Valleys. The latter is the most aggressive on the forest and will bear careful watching.

A center of moderate epidemic was discovered at the head of the John Day Valley.

Little insect activity was noted affecting other tree species on the forest.

No centers of infestation warranting control measures were found on the forest during 1940.

Table No. 1. Description of Check Plots

Areas and Units	Plot Name	Plot Location T.S.	R.E.	Sec. 1/2	Elevation	Type	Site	Pine Timbered Acres	Pine Volume as of Jan. 1, 1939	Board Feet Per Acre
Dale										
Dale	Domas	7	31	32N	3,370	20.5	4	320	4,018,660	12,700
	Big Springs	8	32	8S	4,500	20.5	4	320	2,509,200	7,800
								640	6,527,860	
John Day										
Susanville	Susanville	10	33	17N	3,600	20.5	4	320	2,200,400	6,900
Sumpter										
Burnt River	Experiment Station	12	36	3N	4,400	20.5	4	320	3,512,900	11,000
Unity	Tamarack Spring	13	36	9N	4,300	20.5	3	320	3,912,300	12,300
Sumpter	Smith Creek	9	38	34S	4,950	20.5	4	317	2,179,790	6,900
Bridgeport	Auburn Creek	12	40	3E	4,700	20.5	5	320	2,932,830	9,200
								1,277	12,537,820	
Powder River										
Eagle Creek	Medical Spring	6	42	20W	3,650	20.5	4	320	2,108,180	6,500
	Sparta	8	44	5S	4,800	20.5	4	320	1,726,330	5,400
								640	3,834,510	
Total	9 Plots							2,877	25,100,490	

Table No. 2. Summary of Ponderosa Pine Losses on Check Plots
Survey of 1940

Areas and Plots	1939 Loss: First Marking: Date	1939 Loss: First Marking: Trees	1939 Loss: First Marking: Volume	1939 Loss: Total: Trees	1939 Loss: Total: Volume	1940 Loss: First Marking: Date	1940 Loss: First Marking: Trees	1940 Loss: First Marking: Volume	1940 Loss: Estimating Factor	1940 Loss: Estimated Total: Trees	1940 Loss: Estimated Total: Volume
Dale											
Donas	8-5	0	0	12	7,870	8-24	3	4,180	44.5	7	3,870
Big Springs	8-4	2	4,690	14	15,640	8-26	8	10,180	46.0	17	12,950
		2	4,690	26	23,510		11	14,360		24	16,820
John Day											
Susanville	8-3	3	2,600	23	11,190	8-23	15	7,960	44.0	34	21,500
Sumpter											
Experiment Station	7-31	6	3,070	24	14,820	8-22	37	21,650	43.0	86	59,100
Tamarack Spring	8-1	6	10,020	37	31,020	8-21	24	23,510	42.0	57	48,300
Smith Creek	7-29	5	7,050	18	17,420	8-20	9	8,010	41.5	22	18,150
Auburn Creek	7-28	8	9,615	39	27,455	8-19	20	11,800	40.5	49	32,100
		25	29,755	123	90,715		90	64,970		214	157,650
Powder River											
Medical Spring	7-25	9	7,765	20	12,935	8-15	9	8,360	37.0	24	21,150
Sparta	7-26	4	405	17	3,195	8-16	8	7,060	38.0	21	14,950
		13	8,170	37	16,130		17	15,420		45	36,100
Total		43	45,215	209	141,565		133	102,710		317	242,070

Table No. 3. Recent Infestation Trends on Check Plots

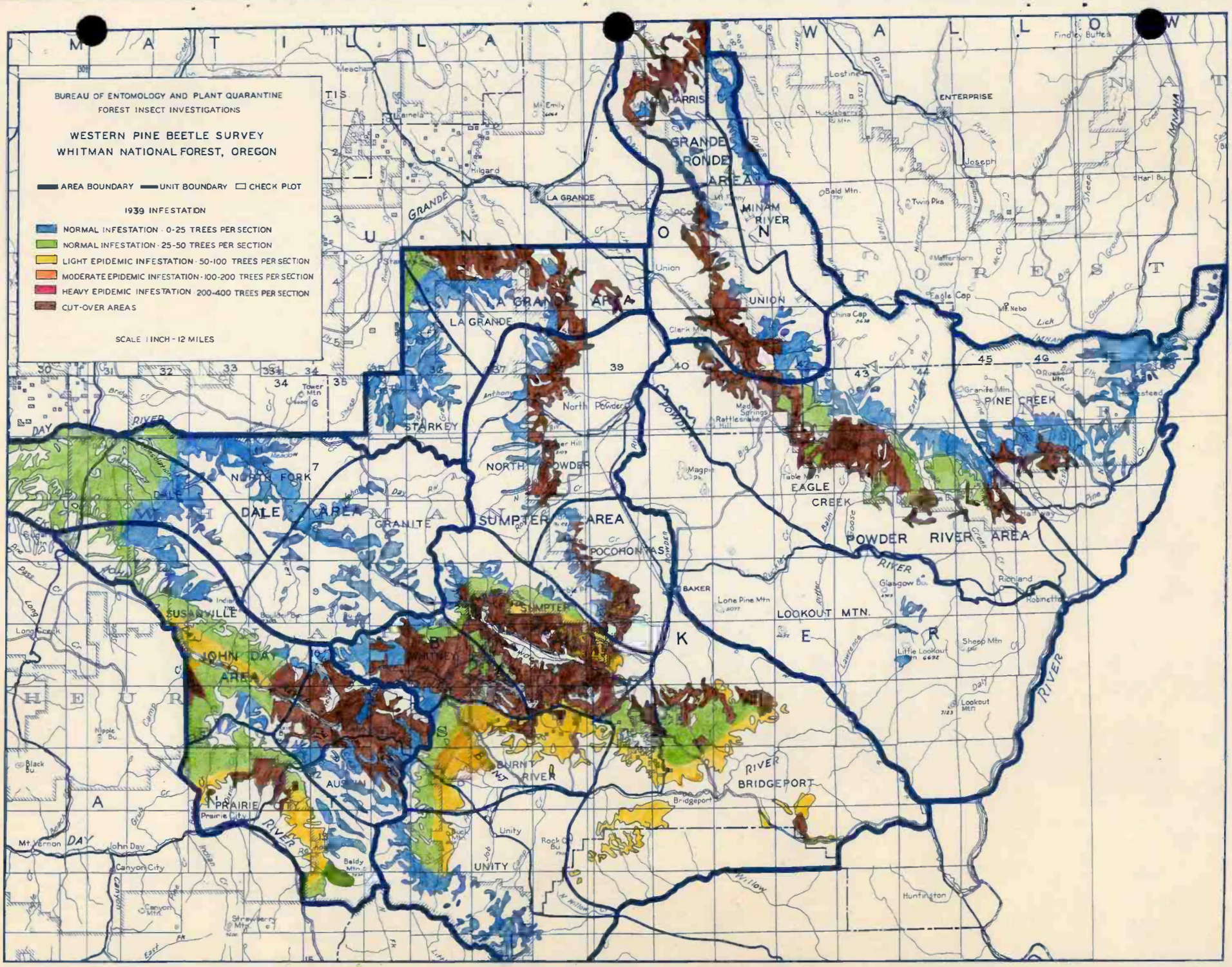
Year of Loss	1938						1939						1940 Probable Loss					
Area and Plot	Trees Killed	Volume Bd.Ft.	Trees per Sec.	Bd.Ft. per Acre	% of Stand	Ratio 1938 to 1937	Trees Killed	Volume Bd.Ft.	Trees per Sec.	Bd.Ft. per Acre	% of Stand	Ratio 1939 to 1938	Trees Killed	Volume Bd.Ft.	Trees per Sec.	Bd.Ft. per Acre	% of Stand	Ratio 1940 to 1939
Dale																		
Domas	10	17,595	20	55	.45	1.37	14	15,640	28	47	.38	.89	17	12,950	34	40	.32	.83
Big Springs	33	11,030	66	34	.44	.81	12	7,870	24	25	.31	.71	7	3,870	14	12	.15	.49
	43	28,625	43	44	.44	1.08	26	23,510	26	37	.36	.82	34	16,820	24	26	.26	.71
John Day																		
Susanville	31	20,825	62	65	.94	1.05	23	11,190	43	35	.51	.54	34	21,500	68	67	.98	1.92
Sumpter																		
Tamarack Spring	51	40,970	102	128	1.04	2.72	37	31,020	74	97	.79	.76	57	48,300	114	151	1.23	1.56
Experiment Station	58	42,230	116	132	1.18	2.49	29	14,820	58	46	.42	.35	86	59,100	172	185	1.68	4.00
Smith Creek	72	52,510	145	166	2.35	3.23	39	27,455	79	86	1.26	.52	49	32,100	99	101	1.48	1.17
Auburn Creek	62	59,780	124	187	2.00	1.23	18	17,420	36	54	.59	.29	22	18,150	44	57	.62	1.04
	243	195,490	122	153	1.54	2.05	123	90,715	62	71	.81	.46	214	157,650	107	123	1.26	1.74
Powder River																		
Medical Spring	69	67,495	138	212	3.12	1.58	20	12,935	40	40	.61	.19	24	21,150	48	67	1.02	1.63
Sparta	41	42,225	82	132	2.39	1.48	17	3,195	34	10	.19	.07	21	14,950	42	47	.87	4.72
	110	109,720	110	172	2.79	1.53	37	16,130	37	25	.42	.15	45	36,100	45	57	.94	2.23
Total	427	354,660	95	123	1.39	1.65	209	141,545	47	53	.60	.43	317	242,070	70	84	.97	1.60

Table No. 4. Estimated Ponderosa Pine Losses for 1939

Areas and Units	Ponderosa Pine Acreage		Volume of Pine M.B.M. Jan. 1, 1939	Estimated 1939 Loss				
	Total	Virgin		Trees	Volume MBM	Trees per Spc.	Bd. Ft. per Acre	Percent of Stand
Dale								
Dale	89,600	89,600	575,200	2,700	1,800	19	20	.31
North Fork	40,720	40,720	203,100	760	500	12	12	.25
Granite	19,800	19,800	177,200	121	80	4	4	.05
	150,120	150,120	955,500	3,581	2,380	15	16	.25
John Day								
Susanville	73,450	71,770	559,000	1,900	1,200	17	16	.21
Austin	68,000	14,080	190,600	160	95	2	14	.05
Prairie City	65,790	61,110	308,200	3,000	2,000	29	31	.65
	207,240	146,960	1,057,800	5,060	3,295	16	16	.31
La Grande								
Starkey	27,140	25,680	383,800	200	108	5	4	.03
La Grande	18,240	4,160	50,300	280	150	10	8	.30
	45,380	29,840	434,100	480	258	7	6	.06
Sumpter								
North Powder	18,030	6,010	92,600	430	85	15	5	.09
Pocahontas	15,300	5,460	24,400	200	40	8	3	.16
Sumpter	52,500	11,920	224,300	1,510	990	18	19	.44
Whitney	37,480	9,080	256,800	600	270	10	7	.11
Burnt River	40,100	33,460	397,900	4,900	3,400	78	85	.86
Bridgeport	55,350	38,710	371,900	2,420	2,000	28	36	.54
Unity	24,240	24,240	444,200	1,450	1,230	39	46	.25
	243,000	128,880	1,812,100	11,510	8,015	30	33	.44

Table No. 4 (continued)

Areas and Units	Ponderosa Pine Acreage		Volume of Pine M.B.M.	Estimated 1939 Loss				
	Total	Virgin	Jan. 1, 1939	Trees	Volume M.B.M.	Trees per Sec.	Bd. Ft. per Acre	Percent of Stand
Grande Ronde								
Mt. Harris	17,560	5,120	51,600	100	40	4	2	.08
Minam River	4,480	4,480	18,800	46	25	7	6	.13
Union	28,270	11,280	85,200	450	180	10	6	.21
	50,760	16,400	155,600	596	245	8	5	.16
Powder River								
Eagle Creek	69,010	37,370	374,600	1,700	1,500	16	22	.40
Pine Creek	29,070	26,750	162,700	280	200	6	7	.12
Lookout Mtn.	1,920	1,920	19,100	37	20	12	10	.10
	100,000	66,040	556,400	2,017	1,720	13	17	.31
Total	790,500	538,240	4,971,500	23,244	15,913	19	20	.32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